

REMARKS/ARUGMENTS

Upon entry of this reply, claims 1-21 will remain pending. Claims 1, 17, 18, 20 and 21 are independent claims.

Applicants note that claims 22-29 have been added relating to the isotropic magnetically soft pigment having a specific surface area determined on the basis of BET method is more than 100 m²/g. Applicants further note that support for this disclosure appears in Applicants' originally filed application, including paragraph [0057] of the originally filed specification.

Reconsideration and allowance of the application are respectfully requested.

Response to Formal Matters

Applicants express appreciation for the acknowledgment in the Office Action of the claim of foreign priority as well as receipt of the certified copy of the priority document.

Applicants note that the drawings submitted with the application have not been objected to, whereby Applicants assume that the drawings submitted with the application meet formality requirements, whereby further action is not required on the part of the Applicants.

Request For Completely Initialed Form PTO-1449

Applicants note that the initialed copy of the Form PTO-1449 attached to the Office Action includes crossing out of eight citations in the "Foreign Patent Documents" section, and a note is included on the form that "No translation or Statement of relevance".

In response, Applicants respectfully submit that:

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DE 198 38 799 A1 is accompanied by the cover page of WO 00/13176 which includes an English language abstract. Moreover, this document is cited and discussed in the specification beginning at paragraph [0014].

DE 195 04 930 is accompanied by family member U.S. Patent No. 5,858,097 which is in English. Moreover, this document is cited and discussed in the specification beginning at paragraph [0098].

DE 197 47 068 A1 is accompanied by family member U.S. Patent No. 6,235,368 which is in English. Moreover, this document is cited and discussed in the specification beginning at paragraph [0016].

DE 26 42 383 A1 accompanied by family member Canadian Patent No. 1,066,483 which is in English. Moreover, this document is cited and discussed in the specification beginning at paragraph [0061].

DE 30 27 012 A1 accompanied by family member U.S. Patent No. 4,329,241 which is in English. Moreover, this document is cited and discussed in the specification beginning at paragraph [0016].

DE 44 27 821 A1 accompanied by an English language abstract. Moreover, this document is cited and discussed in the specification beginning at paragraph [0016].

EP 0 654 165 accompanied by family member U.S. Patent No. 5,601,647 which is in English. Moreover, this document is cited and discussed in the specification beginning at paragraph [0099].

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FR 2 734 500 accompanied by family member U.S. Patent No. 5,704,978 which is in English. Moreover, this document is cited and discussed in the specification beginning at paragraph [0099].

Thus, each of the documents includes discussion in Applicants' specification and an English abstract or an English language family member. Accordingly, Applicants respectfully request that a completely initialed form be forwarded to Applicants in order that Applicants' file can reflect the Examiner's consideration of the foreign patent documents in as well as the already considered specification and related English language documents.

For the Examiner's convenience, another copy of the Forms PTO-1449 is included herewith.

Response To Maintaining Of The Restriction Requirement

Applicants note that the Restriction Requirement has been maintained, and has been made final. In particular, it is noted that Group I, i.e., claims 1-16, 18, 19 and 21, are under prosecution, and that claims 17 and 20 stand withdrawn from consideration.

Moreover, of the newly-added claims, it appears that claims 22, 23, 26 and 27 will be grouped with the elected invention, while claims 24, 25, 28 and 29 will be grouped with the non-elected invention

Applicants respectfully request rejoinder of the non-elected claims upon allowance of the elected group of invention.

Prior Art Rejections

The following rejections are set forth in the Official Action:

(a) Claims 1-3, 5-7, 12, 15, 18, 19 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Munch et al., U.S. Patent No. 5,641,355 (hereinafter "Munch") in view of Inoue et al., U.S. Patent No. 5,989,703 (hereinafter "Inoue").

(b) Claims 4, 8-11 and 13-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Munch, U.S. Patent No. 5,641,355, in view of Inoue, U.S. Patent No. 5,989,703, and Yamazaki et al. (hereinafter "Yamazaki").

In response to the rejections of record, Applicants note the following:

Applicants' invention as recited in independent claim 1 is directed to a multilayer magnetic recording medium which comprises, on a nonmagnetic substrate, at least one upper binder-containing magnetic recording layer which has a thickness of less than 0.5 μm and contains finely divided magnetic pigment having a coercive force H_c of 100 – 250 kA/m, and at least one lower binder-containing layer which contains an isotropic magnetically soft pigment which is selected from $\gamma\text{-Fe}_2\text{O}_3$, Fe_3O_4 or a solid solution of these components and has a mean crystallite size of less than 10 nm.

Moreover, Applicants' independent claim 18 is directed to a magnetic recording medium containing an upper layer, and a lower layer, said lower layer including magnetically soft pigment which is selected from $\gamma\text{-Fe}_2\text{O}_3$, Fe_3O_4 and a solid solution of these components and has a mean crystallite size of less than 10 nm.

Still, further Applicants' independent claim 21 is directed to magnetic tape, magnetic card or floppy disk comprising a multilayer magnetic recording medium which comprises, on a nonmagnetic substrate, at least one upper binder-containing magnetic recording layer which has a thickness of less than 0.5 μm and contains a finely divided magnetic pigment having a coercive force H_c of 100 – 250 kA/m, and at least one lower binder-containing layer which contains an isotropic magnetically soft pigment which is selected from $\gamma\text{-Fe}_2\text{O}_3$, Fe_3O_4 or a solid solution of these components and has a mean crystallite size of less than 10 nm.

Thus, amongst other features recited in Applicants' claims, Applicants' claims recite a magnetic recording medium containing an upper layer, and a lower layer, with the lower layer including magnetically soft pigment which is selected from $\gamma\text{-Fe}_2\text{O}_3$, Fe_3O_4 and a solid solution of these components and has a mean crystallite size of less than 10 nm.

The advantages of Applicants' invention including such multilayered magnetic recording medium including upper and lower layers, and the lower layer containing magnetically soft pigment which is selected from $\gamma\text{-Fe}_2\text{O}_3$, Fe_3O_4 and a solid solution of these components and has a mean crystallite size of less than 10 nm are discussed throughout Applicants' specification, and are set forth in Applicants' Examples. In this regard, the Examiner's attention is directed to Example Nos. 1-4 which have mean crystallite sizes of 4.5, 5 and 5.5 as compared to comparative examples 6-9 having mean crystallite sizes of 12, 14.5, 15 and 11.5. The RF level for the Comparative Examples is about 1 dB lower than in the Examples according to the invention.

Applicants' invention provides a multilayer magnetic recording medium for high recording densities, which recording medium contains a magnetic pigment having a high coercive force in the upper magnetic layer and magnetically soft pigments in the lower layer and has excellent electromagnetic recording properties, in particular a high RF layer.

In contrast to Applicants' disclosed and claimed invention and as recognized by the Examiner in the rejection:

Munch et al. do not teach that the lower layer comprises an isotropic magnetically soft pigment, which is selected from γ -Fe₂O₃, Fe₃O₄, or a solid solution of these components, and has a mean crystalline size of less than 10 nm (or 6 nm as recited in claim 5).

In an attempt to make up for the deficiencies of Munch, the rejections rely upon Inoue. However, Inoue does not teach or suggest a lower layer including magnetically soft pigment which is selected from γ -Fe₂O₃, Fe₃O₄ and a solid solution of these components and has a mean crystallite size of less than 10 nm. Moreover, Inoue does not teach or suggest a magnetic recording medium containing an upper layer, and a lower layer, with the lower layer including magnetically soft pigment which is selected from γ -Fe₂O₃, Fe₃O₄ and a solid solution of these components and has a mean crystallite size of less than 10 nm.

Expanding upon the above, Inoue does not disclose any characteristics about a multilayered magnetic medium. Moreover, Inoue only discloses a crystallite having size of 30 nm or less, but does not teach or suggest a crystallite having a size of less than 10 nm. In fact, all the Examples in Inoue, as seen in Table 1, have a crystallite size of 17 nm or greater. Moreover, Inoue's claimed invention has a crystallite size ranging from 17 to 28.

There is no teaching or suggestion in Inoue of having a crystallite size of less than 10 nm. All that Inoue discloses is that the production of powders of a crystallite size of 17 nm or greater, and that such powders have a specific surface area of 30 M²/g when measured by a BET method.

Emphasizing the above, Applicants note that Inoue is silent on a soft magnetic γ -Fe₂O₃ pigment in the lower layer of a magnetic recording medium. Inoue discloses the use of a single magnetic layer with a γ -Fe₂O₃ pigment which must be hard magnetic in order to enable a magnetic recording which is in accordance with the knowledge of those of skill in the art. In contrast, the lower layer according to Applicants' invention has a coercive force of less than 0.7 kA/m. The magnetic layer according to Inoue must have a much higher coercive force; see for instance Munch, wherein (column 3, line 63) the magnetic pigment of the recording layer has a coercivity of 60 kA/m, which results in nearly this same value for the magnetic layer.

Moreover, as noted above the pigments according to Inoue, see Table 1, Examples 1-8, have a crystallite size of 17.0 to 28.0 nm and a specific surface area of 26.1 to 28.8 m²/g the soft magnetic pigment of the present invention has a mean crystallite size of less than 10 nm, preferably less than 6 nm.

Thus, even if Munch and Inoue are combined the presently claimed invention would not be present. However, there is no motivation within the documents utilized in the rejections to combine their disclosures in the manner set forth in the rejection. In this regard, Munch is directed to an extrusion coater for the production of a magnetic recording medium, and as noted in the rejection does not teach or suggest, amongst other features recited in Applicants' claims, a

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lower layer comprising an isotropic magnetically soft pigment which is selected from γ -Fe₂O₃, Fe₃O₄, or a solid solution of these components, and has a mean crystalline size of less than 10 nm. Inoue merely discloses certain of these pigments, but does not indicate that the pigments should be included in a lower layer of a multilayered recording medium. Thus, absent Applicants' disclosure there is no motivation to arrive at Applicants' disclosed and claimed invention.

Applicants respectfully submit that the only teaching or suggestion that would lead one having ordinary skill in the art to arrive at Applicants' invention is within Applicants' disclosure, and the use of such disclosure by the Examiner is improper. In order to support the conclusion that the claimed invention is either anticipated or rendered obvious over the prior art, the prior art must either expressly or inherently teach the claimed invention or the Examiner must present a convincing line of reasoning why the artisan would have found the claimed invention to have been obvious in light of the teachings of the references. Ex parte Clapp, 227 U.S.P.Q. 972 (B.O.A. 1985).

Regarding statements regarding inherency in the rejection, Applicants note that the documents utilized in the rejections do not teach Applicants' layers and pigments. The Examiner is reminded that in order for inherency to be present the Examiner has the burden of showing that the result indicated by the Examiner is the necessary result, and not merely a possible result. In re Oelrich, 212 U.S.P.Q. 323 (CCPA 1981); Ex parte Keith et al., 154 U.S.P.Q. 320 (POBA 1966). The fact that a prior art article may inherently have the characteristics of the claimed product is not sufficient. Ex parte Skinner, 2 U.S.P.Q.2d 1788 (BPAI 1986).

As the Board of Patent Appeals and Interferences states in Ex parte Levy, 17 U.S.P.Q.2d 1461, 1463:

However, the initial burden of establishing a prima facie basis to deny patentability to a claimed invention rests upon the examiner. In re Piasecki, 745 F.2d 1468, 223 USPQ 785 (Fed. Cir. 1984). In relying upon the theory of inherency, the examiner must provide a basis in fact and/or technical reasoning to reasonably support the determination that the allegedly inherent characteristic necessarily flows from the teachings of the applied prior art. In re King, 801 F.2d 1324, 231 USPQ 136 (Fed. Cir. 1986); W.L. Gore & Associates, Inc. v. Garlock, Inc., 721 F.2d 1540, 220 USPQ 303 (Fed. Cir. 1983); In re Oelrich, 666 F.2d 578, 212 USPQ 323 (CCPA 1981); In re Wilding, 535 F.2d 631, 190 USPQ 59 (CCPA 1976); Hansgirk v. Kemmer, 102 F.2d 212, 40 USPQ 665 (CCPA 1939). in order for inherency to be present it must be a necessary result, and not merely a possible results. Ex parte Keith and Turnquest, 154 U.S.P.Q. 320 (B.O.A. 1966).

In the instant situation, the rejection must point to specific disclosure in the documents that would be present necessarily therein, and not be the result of combining separate portions of the disclosures of the documents.

Still further, for the reasons set forth above, the rejection which further includes Yamazaki is without sufficient basis for at least the reasons set forth above. Moreover, there is no motivation to combine the three documents in the manner asserted in the rejection to arrive at Applicants' invention. For example, there is no motivation to pick and chose the diverse disclosures of these documents in the manner set forth in the rejection to arrive at Applicants' invention and the disclosed advantages associated with Applicants' invention.

Furthermore Yamazaki uses a hard magnetic pigment with a coercivity of 800 Oe which corresponds to 68 kA/m in the lower layer, whereas the present invention describes a lower layer with a coercivity of less that 0.7 kA/m.

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Moreover, each of the dependent claims is particular over the prior art with the reasons set forth with respect to the independent claims. Moreover, these claims are separately patentable for the features recited therein.

For example, newly-added claims 22-29 recite specific surface area of the pigment which is not taught or suggested in the prior art of record, especially when Inoue discloses a specific surface area of 30 m²/g or less. This assists in one of the advantages of the present invention which provides a magnetic recording medium which is capable of storing large amounts of lubricants in the lower layer.

Moreover, for example, dependent claim 11 is directed to a magnetic recording medium as claimed in claim 1, wherein the magnetically soft pigment in the lower layer is spherical or amorphous. In contrast, the pigments according to Inoue are needle shaped (see col. 2, line 14).

For the reasons set forth above, Applicants' disclosed and claimed invention are not taught or suggested by the prior art, whereby the claims are patentable over the prior art of record, and the rejections should be withdrawn.

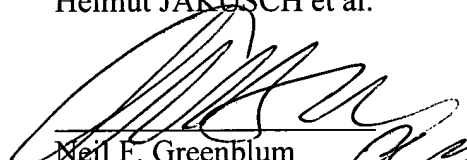
CONCLUSION

In view of the foregoing, the Examiner is respectfully requested to reconsider and withdraw the rejections of record, and allow each of the pending claims.

Applicants therefore respectfully request that an early indication of allowance of the application be indicated by the mailing of the Notices of Allowance and Allowability.

Should the Examiner have any questions regarding this application, the Examiner is invited to contact the undersigned at the below-listed telephone number.

Respectfully submitted,
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October 30, 2003
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